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INDOOR ENVIRONMENTAL AND SERUM PCB TESTING
ALLENDALE ELEMENTARY SCHOOL
PITTSFIELD, MASSACHUSETTS
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Q. Why was environmental sampling and blood testing conducted at the Allendale Elementary School in June 2006?

A. At the request of the Pittsfield Board of Health, the Massachusetts Department of Public Health, Center for Environmental Health (MDPH/CEH) conducted indoor environmental testing at the school in November and December 2005 to address concerns about possible exposure opportunities to PCBs from the nearby General Electric disposal area. Test results revealed no detections of PCBs in the 88 samples taken from throughout the school. Subsequently, MDPH/CEH learned of two filter samples collected from the school by a community resident and analyzed by a different analytical technique by the State University of New York (SUNY) that contained low levels of PCBs in the samples. To address continuing concerns, MDPH/CEH initiated plans to conduct additional testing at the school in collaboration with all additional parties to provide comprehensive and uniform results.

Q. Who collaborated with MDPH/CEH in follow-up indoor environmental testing?

A. MDPH/CEH formed the Allendale Indoor PCB Environmental Sampling Workgroup to help develop a protocol for the follow-up testing. The workgroup was composed of representatives from MDPH/CEH Environmental Toxicology Program; Massachusetts Department of Environmental Protection (MDEP); Pittsfield Board of Health; three laboratories, including both laboratories that conducted the November 2005 analyses; Allendale Elementary School; the Housatonic River Initiative; and the Allendale School Task Force. The U.S. Environmental Protection Agency (USEPA) attended workgroup meetings and provided technical assistance to the workgroup.

Q. What did the Allendale Indoor PCB Environmental Sampling Workgroup do?

A. From January to May 2006, the workgroup held several meetings and conference calls to develop a protocol for the follow-up indoor environmental testing. Based on these meetings, MDPH/CEH developed a draft protocol that was released for public comment in late May 2006. Following public comment, the protocol was finalized and formal responses to comments received were prepared. The protocol contained information such as types of samples, locations

from which samples would be taken, analytical methods to be used by the laboratories, and methods for interpreting results.

Q. Why was blood testing for PCBs offered?

A. In response to concerns of some members of the Allendale School community, MDPH/CEH offered to conduct blood testing for PCBs. For this effort, MDPH/CEH asked for technical assistance from the U.S. Centers for Disease Control and Prevention (CDC) and the MDPH State Laboratory Institute. MDPH/CEH has worked with both CDC and the MDPH SLI since the early 1980s in conducting blood testing for PCBs in numerous investigations in Massachusetts.

Q. Did MDPH/CEH develop a protocol for blood testing?

A. Yes. Concurrent with the indoor environmental sampling work group deliberations, MDPH/CEH worked with CDC and the MDPH SLI to develop a draft protocol and related materials (e.g., consent forms).

Q. Who reviewed the protocol for conducting blood testing?

A. MDPH/CEH, in collaboration with the Pittsfield Board of Health, formed the Health and Medical Peer Review Team (HMPRT) to review and comment on the draft blood testing protocol and related materials. The HMPRT comprised environmental health experts/pediatricians and the Pittsfield Board of Health. They provided comments on the protocol and related materials prior to conducting of the blood testing effort.

INDOOR ENVIRONMENTAL TESTING

Q. When was the indoor environmental sampling conducted?

A. The indoor environmental sampling was conducted in mid-June 2006. Weather conditions were favorable for testing to capture “worst-case” conditions (e.g., warm temperatures), and disposal activities were being conducted at the nearby GE disposal site.

Q. Who conducted the sampling?

A. MDPH/CEH contracted with Environmental Compliance Services (ECS) of Westfield to collect the indoor environmental samples. Accompanying ECS staff were Mr. Geoff Coelho, science teacher, Elaine Krueger, Director of the MDPH/CEH Environmental Toxicology Program, Michael Celona of the MDPH/CEH/ETP, and, for part of the sampling, Dr. Phil Adamo of the Pittsfield Board of Health. In accordance with the protocol, Mr. Coelho selected six locations in the school from where samples would be collected in addition to those already outlined in the protocol.

Q. How many samples were collected?

A. Samples collected included 81 wipe samples from surfaces throughout the school, four indoor air samples (two each collected on two separate days), two outdoor air samples (for comparison and collected on separate days), three dust samples from a carpet, two dust samples from vacuum bags taken from vacuum cleaners at the school after use for one week, and six samples from unit ventilator filters, or a total of 98 samples overall.

Q. What laboratories analyzed the samples?

A. The samples were analyzed by three different laboratories: Spectrum Analytical Inc (SAI), which was the MDPH/CEH contract laboratory for the November 2005 testing; State University of New York at Albany (SUNY), and Southwest Research Institute (SWRI), located in Texas and nationally recognized for its analytical laboratory capabilities.

Q. What analytical methods did the laboratories use?

A. PCBs can be analyzed in two basic ways. One way is to measure for the presence of Aroclors, which are mixtures of individual PCB compounds called congeners. A second way is to measure the individual congeners themselves. SAI analyzed samples using the Aroclor method, SUNY using the congener method, and SWRI using both methods.

Q. How were results from the indoor environmental testing interpreted?

A. MDPH/CEH used available health-based screening values from the U.S. Agency for Toxic Substances and Disease Registry (ATSDR) to evaluate air and dust samples. In addition, dust sample results were compared with the Massachusetts Department of Environmental Protection (MDEP) standard for residential soils. ATSDR does not have guidance available for surface wipe samples but cleanup standards or guidance levels used to determine whether surfaces found to have PCBs should be cleaned are available.

Q. If a sample exceeds a health-based screening level, does that mean that health effects would be expected?

A. No. Health-based screening levels are used to identify those samples that require further evaluation in terms of possible health effects. They are derived based on conservative assumptions (e.g., daily lifetime exposure in a residential setting). Chemical concentrations detected in environmental samples that are less than a screening value are not likely to result in health effects. Chemical concentrations detected in environmental samples above a screening value do not necessarily indicate that a health treat is present, but rather that the potential for exposure to the chemical should be further evaluated to determine whether health effects may be possible given the specific exposure situation.

Q. What were the results of the analyses of the indoor environmental samples?

A. Overall, 93 of 98 indoor environmental samples had either no detectable PCBs or levels of PCBs below any available guidance or standard used to initially screen the results. Two surface wipe samples slightly exceeded cleanup levels established to determine when more cleaning should be conducted, and three dust samples slightly exceeded health-based screening levels.

Q. Where were the surface wipe samples taken that slightly exceeded available cleanup levels?

A. One location was a windowsill located 10 feet from the floor in the gymnasium and the other was a ceiling vent in the health office. In both cases, there was a visible dust layer. At the time of the sampling, the nurse reported that the ceiling vent had not been cleaned in some time.

Q. What dust samples had detections of PCBs?

A. Dust samples from a carpet in the kindergarten room and two dust samples from vacuum bags slightly exceeded guidance levels established by ATSDR for residential soils but were less than the MDEP standard for residential soils. In addition, when summing only the detected Aroclors

or congeners (i.e., non-detected Aroclors or congeners were assumed to be zero), then all levels in all dust samples were well below any available guidance or standard.

Q. What did the results for indoor air show?

A. All indoor air samples were less than or similar to available screening guidance from ATSDR. In addition, outdoor air measurements taken by the USEPA on the Allendale School property at the same time showed higher levels in the EPA outdoor air samples than the comparison outdoor samples collected by MDPH/CEH, but importantly, all results were less than health-based screening values.

Q. Were PCBs detected in the unit ventilator filter samples?

A. Yes. However, no screening values are available for filter samples. Thus, other environmental samples from the two rooms from which the filters were collected were evaluated. This review revealed that all samples (air, surface wipes) either had no detectable PCBs or were less than available screening or cleanup values.

Q. Did MDPH/CEH compare indoor environmental sampling results with data from the scientific literature?

A. Yes. To better evaluate indoor environmental sampling, MDPH/CEH evaluated other studies in the scientific literature that took measurements of indoor air, dust, or surface wipe samples. These studies included studies conducted in schools, day care centers, homes, and other buildings. In all cases, the levels measured at the Allendale School were similar to or less than those measured in these other buildings. These other buildings included the New Bedford High School, day care centers in North Carolina, and residential homes located on Cape Cod.

BLOOD TESTING FOR PCBs

Q. Who was offered blood (serum) testing for PCBs?

A. MDPH/CEH offered blood testing for PCBs to all members of the Allendale School community who requested that they be tested, including staff and current students (through parental consent) and their parents. In addition, MDPH/CEH accommodated requests from other individuals who requested the testing, such as former students at the school, adult volunteers, nearby residents, and others.

Q. How did MDPH/CEH notify individuals of the blood testing offer?

A. MDPH/CEH sent letters home with students on April 11, 2006, notifying the families of the offer to conduct blood testing should they request it for their children or themselves. In addition, there was media coverage in local newspapers about the offer, and MDPH/CEH held a public meeting for the Allendale School community in May 2, 2006, to explain the details of the offer.

Q. What did the blood testing offer involve?

A. If individuals asked to have their blood tested, MDPH/CEH followed up by first sending the requestor a consent form to sign for themselves or on behalf of their child. The consent form was approved by the MDPH Institutional Review Board and the MDPH General Counsel's office. Once the signed consent form was returned to MDPH/CEH, staff then interviewed participants using a questionnaire designed to gather information on important risk factors that

are known to contribute to blood (serum) levels of PCBs (e.g., age, occupational exposures, fish consumption). Other information, such as length of attendance or work history at the Allendale School, was also gathered. Finally, MDPH/CEH arranged to have blood draws at the Berkshire Medical Center.

Q. Who trained staff at the Berkshire Medical Center for blood drawing for PCB testing?

A. MDPH/CEH contracted with Berkshire Medical Center for phlebotomy services. Training of BMC staff for this blood sampling was done by staff from the MDPH State Laboratory Institute. Training included details on sample collection and quantity, sample handling and packaging, and sample shipping to the MDPH SLI in Jamaica Plain, Massachusetts. Blood samples were collected from participants in the offer from late May to late July 2006.

Q. Who analyzed the blood samples?

A. The U.S. Centers for Disease Control and Prevention (CDC) agreed to conduct the analyses of the Pittsfield blood samples. Once all blood samples were collected by late July 2006, all samples were shipped to CDC from the MDPH SLI in August 2006.

Q. What analytic method did CDC use to analyze the blood samples?

A. CDC used state-of-the-art analytic methods to determine specific PCB congeners in the serum samples. These methods are currently used by CDC in the National Health and Nutrition Examination Survey (NHANES), which is a national survey representing a random sample of the non-institutionalized U.S. population. CDC measured for the presence of 35 PCB congeners in the Pittsfield residents based on the congeners analyzed for NHANES.

Q. How were serum PCB levels for Pittsfield residents evaluated?

A. Data from the latest NHANES (reported in the Third National Report on Human Exposure to Environmental Chemicals published in 2005) results were compared with the Pittsfield results (report is available at www.cdc.gov/nchs/about/major/nhanes/guidelines.htm). Data from NHANES are available for children aged 12-19 years and adults 20+ years old. Thus, the children participants in this effort were compared with data from the 12-19 year old group, while adults were compared to the 20+ year age group. In addition, MDPH/CEH evaluated the scientific literature for data on children or adults in other studies in the U.S. or the world.

Q. How did CDC report the serum PCB results?

A. CDC determined that 15 congeners most frequently detected in the U.S. population were also most frequently detected in the Pittsfield participants and hence, CDC provided comparison data from NHANES for the sum of these 15 congeners. In addition, CDC reported total PCBs based on a whole weight basis, as well as a lipid-adjusted basis. The whole weight data most closely approximate what has historically been reported in the scientific literature for serum PCBs. With recent analytic advances, CDC and other laboratories around the world are now reporting concentrations on a lipid-adjusted basis because PCBs tend to concentrate in lipid (or fatty) tissue.

Q. How many people participated in the offer to conduct blood testing?

A. A total of 32 individuals participated in the blood testing. Of these, 14 were children (aged 8-19 years) and 18 were adults (age 20-59 years). Of the children, seven were current Allendale students and ranged in age from 8-10 years. Of the adults, four were current Allendale staff.

Q. What were the results for children?

A. For the 14 children overall, the median serum PCB level was 0.121 ppb (whole weight). This compared to the 50th percentile (or median) value from NHANES for the age group 12-19 years of 0.345 ppb (i.e., 50 percent of all children tested nationally in this age group had serum PCB levels less than or equal to 0.345 ppb). The median lipid-adjusted value for the 14 children was 25.7 ppb, compared to the NHANES 50th percentile of 71.8 ppb. Thus, the Pittsfield children participants had lower median serum PCB levels than the U.S. population in the 12-19 year old age group.

Q. What were the results for the seven current Allendale students?

A. The median serum PCB concentration for the current Allendale students was 0.117 ppb (whole weight). This compared to the NHANES median value of 0.345 ppb for children 12-19 years old. The median lipid-adjusted value for the current Allendale students was 25.2 ppb versus the comparable NHANES value of 71.8 ppb. All current Allendale students had serum PCB levels less than the NHANES median for the U.S. population for the age group 12-19 years old.

Q. What were the results for the adult participants?

A. The median serum PCB concentration for the 18 adults was 0.918 ppb (whole weight). This compared to the NHANES median concentration for adults 20+ of 1.062 ppb and the NHANES 75th percentile of 1.883 ppb (i.e., 75 percent of adults tested nationally had serum PCB levels less than or equal to 1.883 ppb). The median lipid-adjusted value for the Pittsfield adults was 176.1 ppb. This compared to the 50th percentile value from NHANES of 168.5 ppb and the 75th percentile from NHANES of 291.8 ppb.

Q. What were the results for the four Allendale staff who participated in this testing offer?

A. The median serum PCB concentration for these individuals was 1.618 ppb (whole weight). This compared to the NHANES median concentration for adults of 1.062 ppb. All four individuals were less than the NHANES 75th percentile concentration. That is, 75 percent of the U.S. population has serum PCB levels less than or equal to 1.883 ppb, and all Allendale staff had serum PCB levels less than this value. Importantly, the individual who had worked the greatest length of time at the Allendale had one of the lowest serum PCB levels.

Q. How did the Allendale results compare with data from the scientific literature?

A. MDPH/CEH evaluated scientific studies that reported PCB levels in the blood of children to compare to the Pittsfield child participants. The Pittsfield results were lower than those reported in studies from Germany and the Netherlands. For example, a German study evaluating children ages 7-10 years old reported average serum PCB concentrations (whole weight, 8 congeners) ranging from 0.33 to 0.54 ppb. All of the current Allendale children (aged 8-10 years) had levels lower than these concentrations.

Q. Did CDC provide an opinion on the results of the Pittsfield serum PCB testing?

A. Yes. CDC reported that “Results of the analyses on the Pittsfield participants revealed that the Pittsfield participants showed low PCB levels on either a whole weight basis or on a lipid-adjusted congener basis as compared with the third National Report data.” In addition, CDC evaluated the congener pattern seen in the Pittsfield participants and reported the following: “This review did not reveal any unusual patterns among the Pittsfield participants to suggest that exposures that may have led to any evidence of PCBs in blood samples are different than the U.S. population.”

CONCLUSIONS

Q. What did MDPH/CEH conclude about the indoor environmental and serum PCB testing?

A. The MDPH/CEH concluded that results from the indoor environment and serum PCB testing at the Allendale School did not reveal unusual opportunities for PCB exposures to the Allendale School community or to other participants in the serum PCB testing.

Q. What recommendations did MDPH/CEH make?

A. MDPH/CEH recommended that more aggressive cleaning of certain surfaces in the school (e.g., windowsills) be conducted and continue to be conducted on a routine basis. In addition, at the request of the Pittsfield Board of Health or community residents, MDPH/CEH will evaluate any ambient air results of testing being conducted by the USEPA that may be of concern.

Q. Will I have an opportunity to review and comment on the MDPH/CEH report?

A. Yes. MDPH/CEH is releasing the report for a 30-day comment period, ending on Wednesday, November 22, 2006. Comments should be sent to Michael Celona, Senior Environmental Analyst, Environmental Toxicology Program, Center for Environmental Health, Massachusetts Department of Public Health, 7th floor, 250 Washington Street, Boston, MA 02108. MDPH/CEH will review and respond to all public comments and release a final report following completion of the responses.

Q. Where will the report be available?

A. The report and this Informational Fact Sheet will be available on the MDPH/CEH website at www.mass.gov/dph/ceh.

Q. Who can I call with questions?

A. You can call the MDPH/CEH Environmental Toxicology Program at the toll-free number, 1-800-240-4266 if you have any questions.